Electronic Supplementary Information for Nanoscale

Supporting information

Engineering Biofunctional Magnetic Nanoparticles for Biotechnological Applications

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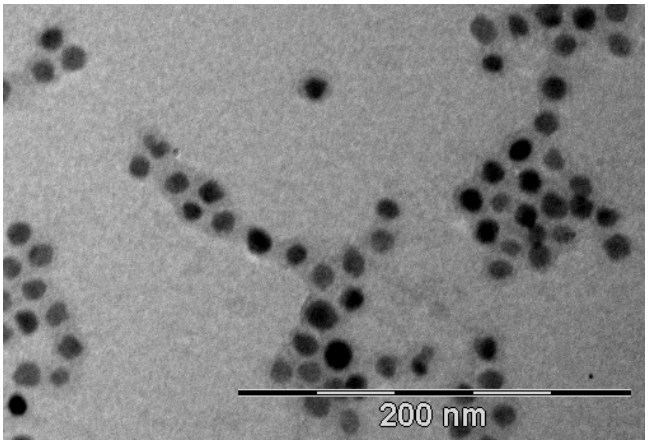

Figure S1. TEM image of NPs synthesized with 2 mg of PMAO/mg of NP. As it can be seen, multiple NPs have been wrapped in the same polymer shell.

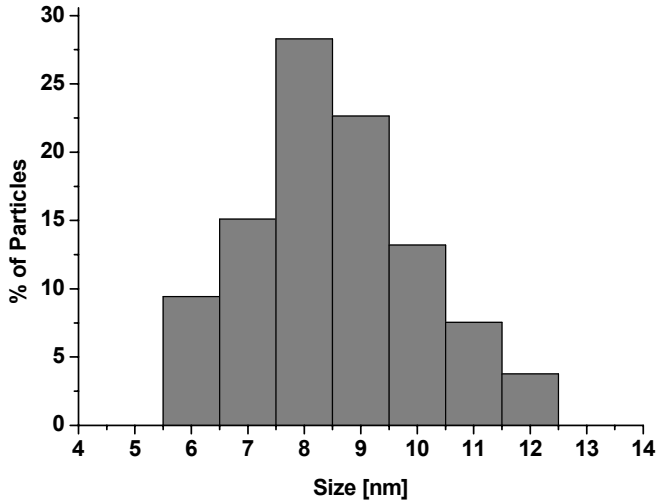

Figure S2. Particle size histogram obtained from the TEM data (PMAO-NPs)

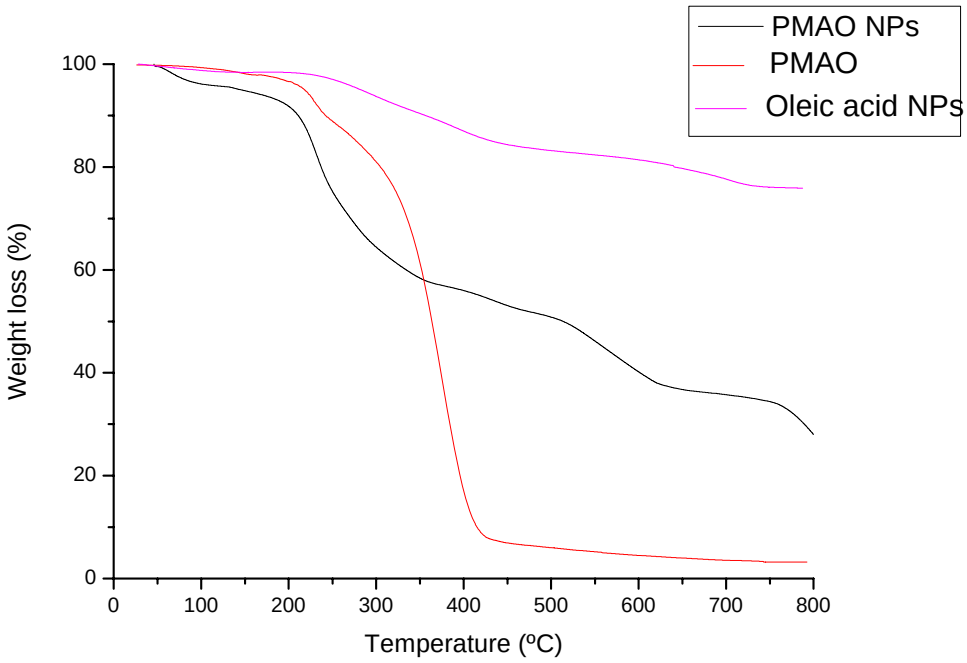

Figure S3. Thermogravimetric analysis curve of PMAO, oleic acid NPs and PMAO coated NPs under a nitrogen atmosphere.

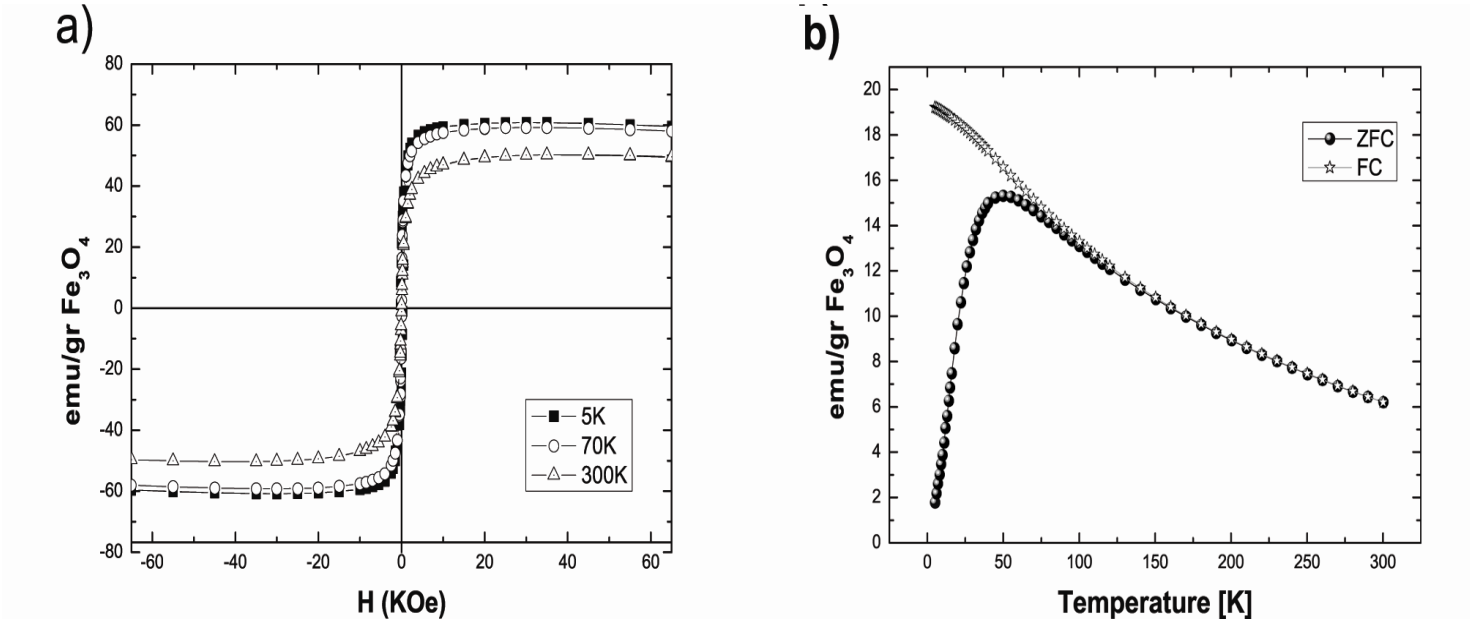

Figure S4 **a)** Magnetization curves of the 8 nm PMAO NPs measured at 5, 70 and 300 K. **b)** Temperature dependence of the zero-field cooled/field cooled (ZFC/FC).

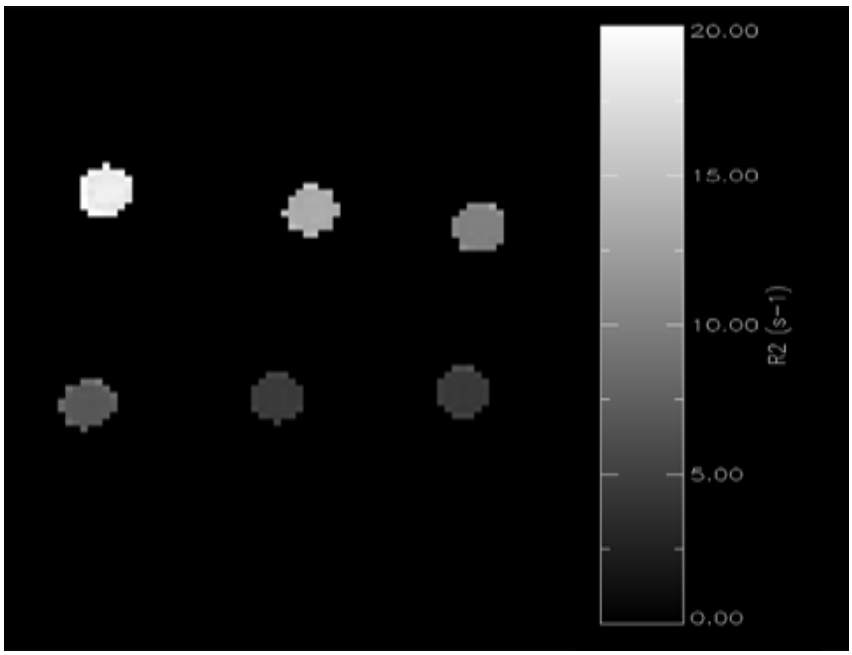

Figure S5. R_2 map of a phantom containing different concentrations of PMAO coated NPs: 0.3, 0.25, 0.17, 0.08, 0.03 mM of Fe.

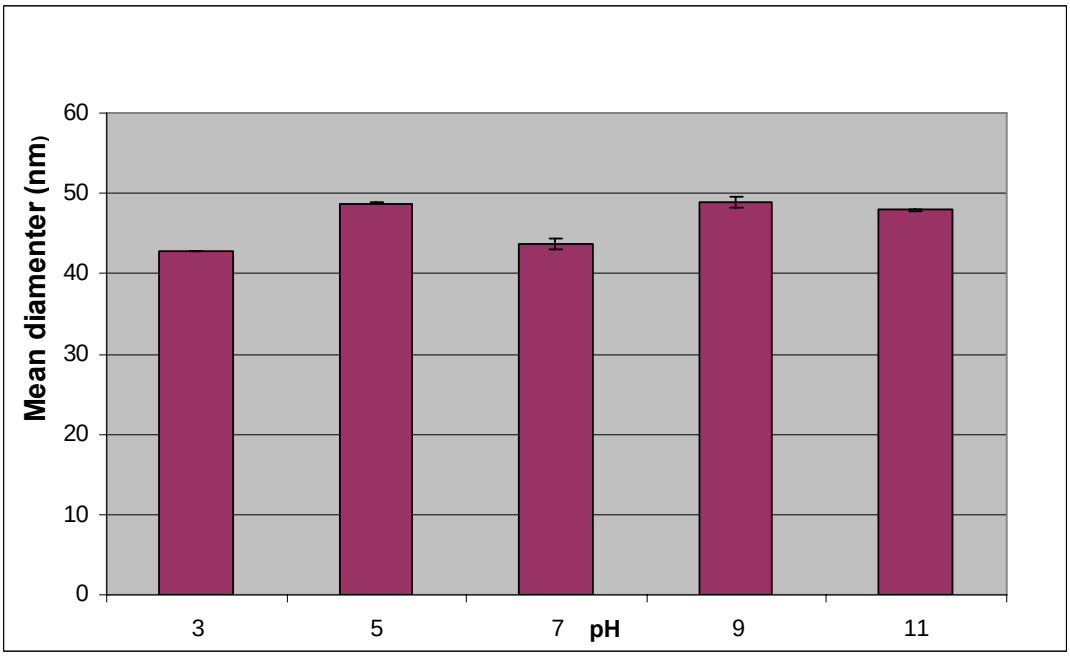

Figure S6. Hydrodynamic size of PMAO NPs at different pHs, demonstrating their stability over a wide range of pHs. DLS measurements were repeated three times for each sample. Results are given in terms of intensity.

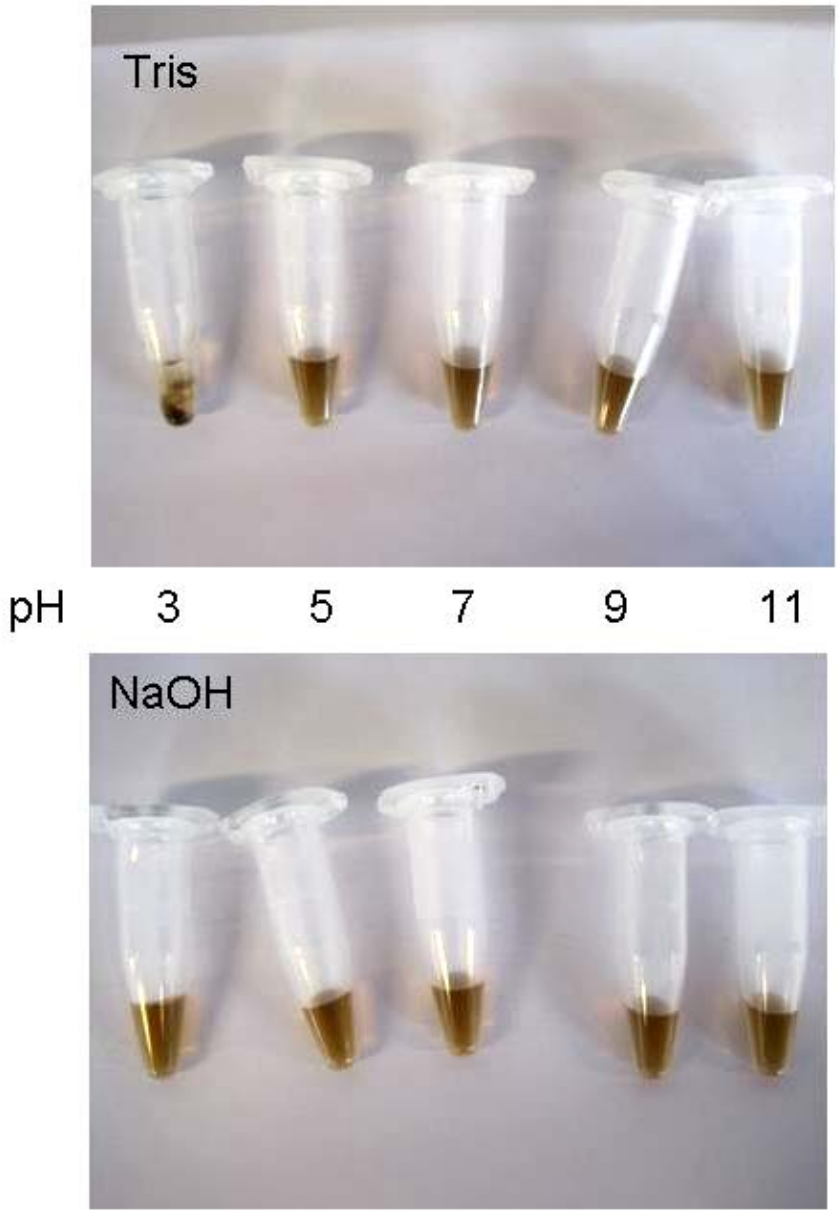

Figure S7: Stability of PMAO-NPs hydrolized with Tris or NaOH. NaOH hydrolized NPs remain stable from pH 3 to 11, while Tris hydrolized NPs due to a less surface charge precipitate at pH 3.

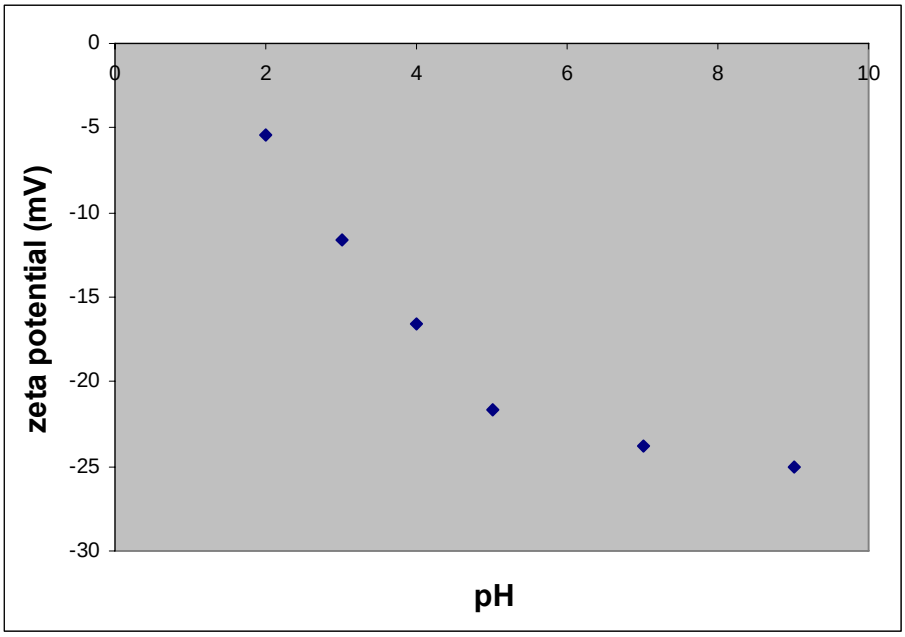

Figure S8. Zeta potential of PMAO NPs at different pHs. At pH 4,7 and 7,4, where the protein adsorption studies were carried out, NPs remain negatively charged.

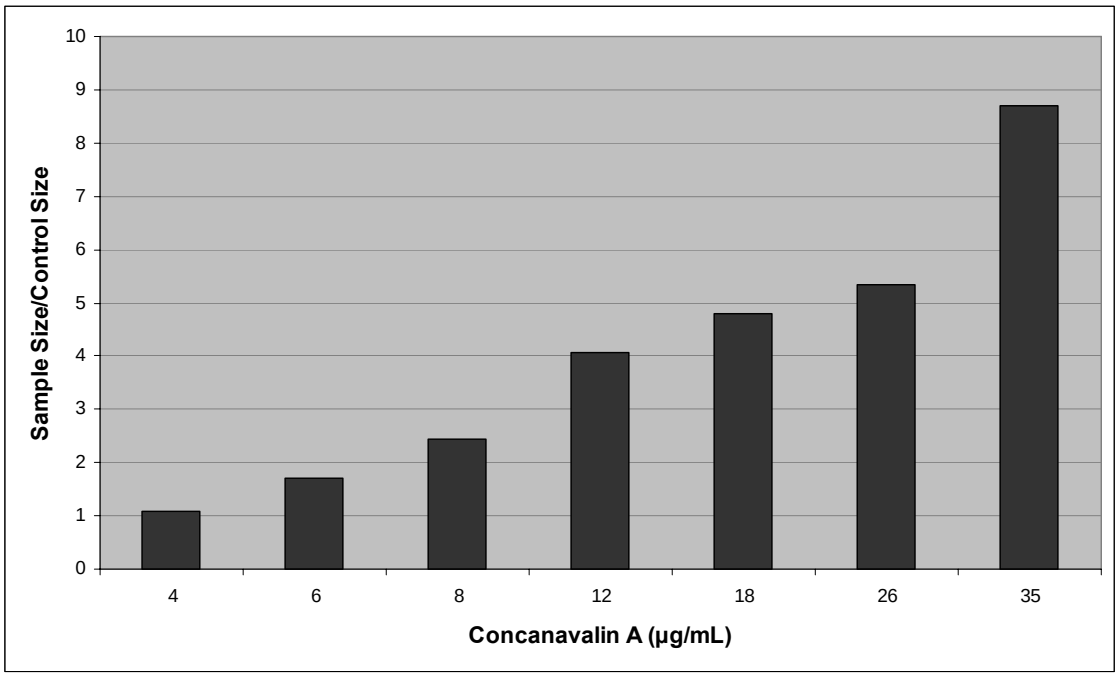

Figure S9. Representation of the size increase of Glucose NPs as a consequence of the Concanavalin A addition.

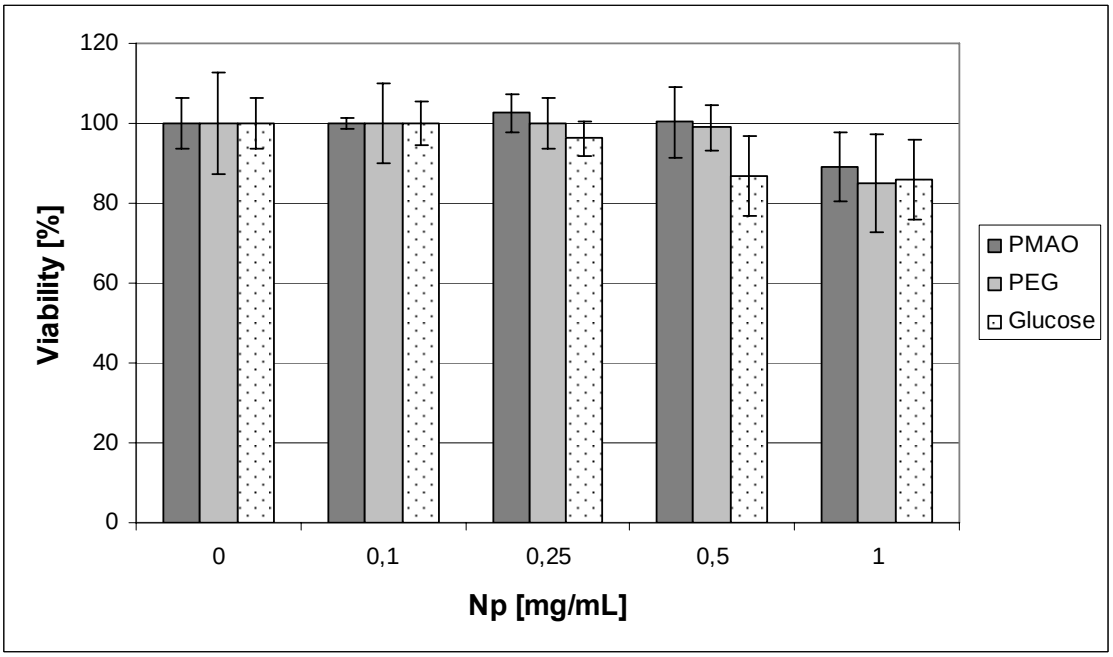

Figure S10. MTT assay performed in HeLa cell line with PMAO, glucose and PEG NPs

Table S1: Hydrodynamic size of PMAO NPs after being washed for three times with hexane or chloroform, or maintained for 24 hours in PBS solution. Control NPs were kept in distilled water for the same time. Sizes are given in terms of intensity. Standard deviation ≤ 5%

	Mean Size (nm)
PMAO NPs (control)	43.7
NPs washed with hexane	45.5
NPs washed with chloroform	42.7
NPs in PBS	42.1